Advances in Functional Neurological Disorders

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PRESIDENT'S COLUMN

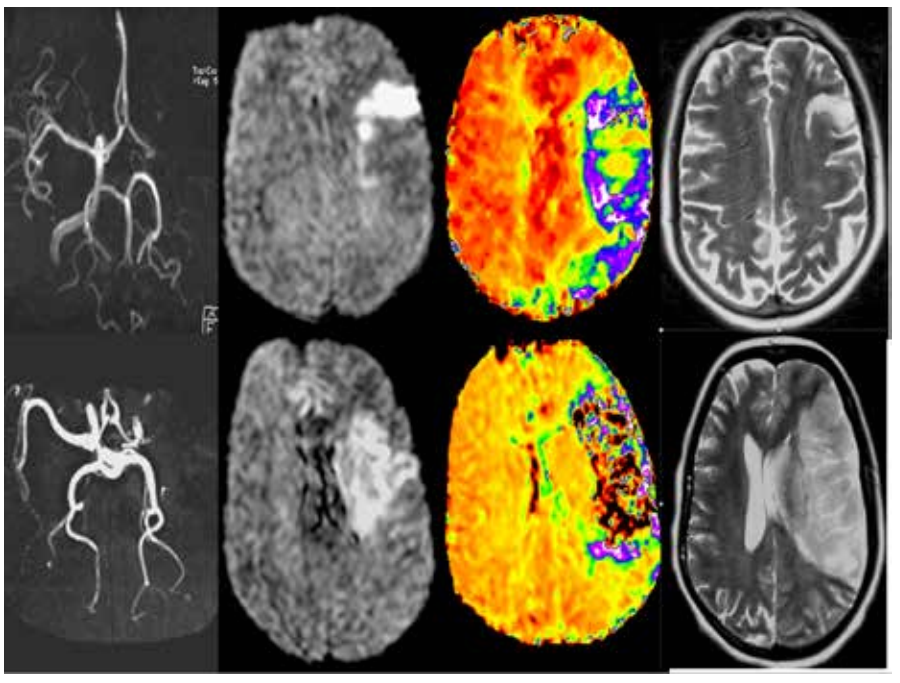
Stroke: Back to Where It Belongs

BY RAAD SHAKIR, MD

If someone anywhere in the world had a stroke or a TIA in the last 60 years, the World Health Organization (WHO) coding system placed the event under either vascular diseases or episodic symptoms, not in the appropriate central nervous system chapter of ICD-10. This situation started with ICD-7 in 1955 and has continued since. It skews all statistics of neurological diseases produced by the WHO. ICD-10 has been in use since 1990, and a total revamp is long overdue. The information is not only stale and old, but incorrect. Codes such as "slow virus infection" for prion diseases are expected to be used in the 21st century?

RAAD SHAKIR, MD

The WHO Department of Mental Health and Substance Abuse, where neurology sits, commissioned a Neurosciences Topic Advisory Group (Neurology TAG) in 2009. I have had the privilege of chairing the TAG, which expanded to involve specialists from all neuroscience specialties. The tasks were huge and detailed. The aim was to produce ICD-11, which will both serve the needs of the non-specialists as well as those working in highly developed institutions.



Brain imaging studies capture the evolution of acute ischemic stroke in two patients.

Perhaps the most important ICD-10 anomaly the TAG faced was the situation of cerebrovascular diseases (CVDs) and their future placement in ICD-11. Attempting change of the basic architecture of ICD-10 required a major case to be made on the reasoning and practicality of changing an existing status. CVDs fell under Circulation Disorders on the premise that they are a

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TURNING A NEGATIVE INTO A POSITIVE

Advances in Functional Neurological Disorders

BY JON STONE, INGRID HOERITZAUER, AND MARK HALLETT

Functional neurological disorders, also known as psychogenic, conversion, or non-organic disorders, account for at least one in six new attendances to neurology clinics[1]. Traditionally ignored in neurology research and training, this trend has been slowly reversing itself over the last decade.

There have been significant advances in classification, phenotyping, understanding of etiology, and mechanism as well as new and encouraging evidence for treatment. Functional neurological symptom disorder, the alternative name for conversion disorder in DSM-5, witnessed two important changes in diagnostic emphasis from DSM-IV. A psychological stressor is no longer required to make the diagnosis. It is now clear that not all patients have them. More importantly, the criteria emphasize that this is not a diagnosis of exclusion. The patient must have positive physical signs of a functional disorder, such as Hoover's sign of functional leg weakness, a tremor entrainment sign, or positive features of a dissociative/psychogenic (non-epileptic) seizure.

Neurologists have long used such signs to make the diagnosis, but now there is a range of evidence to support their use. Inclusion in the neurology section of the forthcoming ICD-11 also will reflect these disorders' status at the interface between neurology and psychiatry[2].

New ideas and studies have introduced the importance of separating etiology (the wide range of biological and psychosocial factors that may make someone vulnerable to a functional disorder) from mechanism. For instance, how does the nervous system go wrong to lead to the symptom of a weak leg or a blackout? Clinically, we recognize that patients' symptoms are characterized by movements that look voluntary, but experienced by the patients as involuntary. Functional MRI (fMRI) studies

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suggest an abnormal network, including prominently the temporoparietal junction, which may be associated with aberrant motor planning, and a reduction in the sense of "agency" for movement. These are core to the experience of patients[3,4]. (See Figure 1.) fMRI also has shown abnormal connectivity between emotional centers, such as the amygdala and the premotor areas in patients with functional disorders, not seen in healthy controls[5].

Symptom Generation

Studies in motor and seizure symptoms converge on the importance of an initial triggering event, such as physical injury, panic attack, or fainting, in shaping symptoms. Models of symptom generation emphasize the importance of a state of abnormal-self-directed attention in which a top-down process driven in part by these triggering events and their effect on patient's expectations can fundamentally and persistently alter sensation and action regardless of the patient's current emotional state[6]. Taken together, recent studies suggest a disorder of abnormal integration of agency and sensorimotor brain function that cannot be neatly pigeonholed as either purely neurological or psychological.

Neurologists have often expressed pessimism about treatment outcomes for functional disorders. Some solutions are, however, becoming clearer. There is general agreement that successful communication of the diagnosis is an essential platform to allow further treatment to succeed. Bewildered or angry patients who feel they are being accused of feigning symptoms are probably not going to do as well as those whose neurologists have helped them to see that they have a common, genuine, and potentially reversible condition[1].

Online resources that have been made available by health professionals include **www.neurosymptoms.org**. Resources for patients include **www.fndhope.org** and **www.fndaction.org.uk**.

Randomized Controlled Trials

For patients with motor symptoms, physical therapy specifically designed for the unique nature of functional disorders has now been demonstrated to be an effective treatment in two randomized controlled trials (RCTs).

An RCT of a five-day physiotherapy program in 60 patients with functional motor disorders and a mean duration of symptoms of 5.8 years showed an improvement at six months in 72 percent of the intervention group compared to only 18 percent of controls undergoing a similar quantity of generic physiotherapy[7].

Another trial of in-patient treatment, also of 60 patients, showed an increase of seven points on a 15-point mobility scale. Effects were sustained at one year even though patients had been treated nine months after symptom onset[8].

Two RCTs of psychological therapy for dissociative (non-epileptic) seizures also have been encouraging, and a larger multicenter study is under way in the U.K. [9,10,11]. Cognitive behavioral therapy can focus on identifying the warning symptoms that commonly herald a seizure (but are often unreported by patients), tackling avoidance, and dealing with thoughts that may influence seizure control, such as mood or self-esteem. Reduction in seizure frequency was maintained at a six-month follow-up despite a six-year duration of events.

Neurologists often find the diagnosis and treatment of functional disorders a challenging and negative experience, one that is often mirrored and amplified by the patient's unhappiness. The message from the new wave of research on this topic is, "It doesn't have to be this way."

As neurologists, we can turn those negatives into a positive. We can learn to make diagnoses, as we do for other conditions, based on positive clinical features, not normal investigations; appreciate that these disorders need an understanding of the brain as well as the mind; and recognize that evidence-based psychological and physical treatment in the context of a transparent and supportive initial neurological encounter can be surprisingly effective.

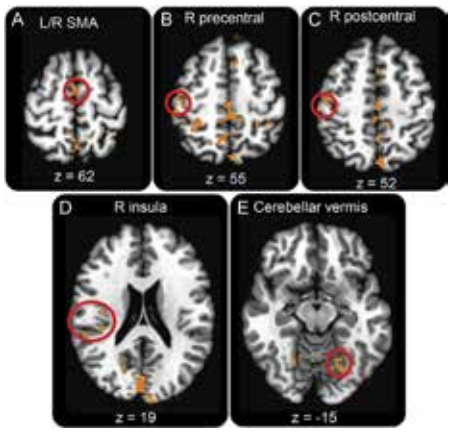

Figure 1. Resting state fMRI in 35 patients with functional movement disorder (FMD) compared to 35 controls. FMD patients had decreased functional connectivity between the right temporoparietal junction and bilateral sensorimotor regions, suggesting impaired motor feed-forward and sensory feedback signaling to this integrative region involved in "agency." Threshold set at p<0.02; cluster size 28 voxels. Z score of >2.33 is equivalent to p<0.01. Reproduced with permission from reference 3.

Upcoming Conference

If this update has whet your appetite, you are invited to the third International Conference on Functional (Psychogenic) Neurological Disorders that will take place Sept. 6-8, in Edinburgh, Scotland. **(www.fnd2017.org).**

This unique event, based on a recent 51-chapter volume of the *Handbook of Clinical Neurology* series[12], and supported

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FROM THE EDITORS

BY STEVEN L. LEWIS, MD, EDITOR, AND WALTER STRUHAL, MD, CO-EDITOR


STEVEN L. LEWIS, MD


WALTER STRUHAL, MD

We are pleased to introduce the May/June 2017 issue of *World Neurology*. The issue begins with the important news from WFN President Raad Shakir (see page 1), who reports on the momentous and exciting decision by the World Health Organization to classify Stroke under the Central Nervous System chapter of the International Classification of Diseases (ICD-11). On the topic of stroke, Dr. Wolfgang Grisold, secretary-general of the WFN, and Dr. Mohammed Wasay, remind us that the topic of World Brain Day 2017 is devoted to stroke awareness, prevention, and management. Dr. William (Bill) Carroll, first vice president of the WFN, and the convener of the Global Neurology Network, provides the background and analysis underlying the need for a global neurology alliance to address the global burden of neurological disease.

Dr. Grisold and Riadh Goulder, MD, provide their report on the recent and highly successful first African Academy of Neurology (AFAN) Conference & 15th Pan Arab Union of Neurological Societies (PAUNS) meeting that was just held in March in Yasmine-Hammamet, Tunisia. Marina Alpaidze, MD, PhD, and Alexander Razumovsky, PhD, FAHA, report on the third WFN neurosonology teaching course that took place in October 2016 in Tbilisi, Georgia.

Dr. Mohammad Bassam Hayek, a neurologist in Aleppo, Syria, and the vice president of the Syrian Society for Neuroscience, provides us with an important on-the-scene update on the recent and current state of neurology and neurological care in Syria.

Giordani Rodrigues dos Passos, MD, reports on his recent eye-opening and successful participation in the Canadian/WFN Department Visit Program, where he visited the Montreal Neurological Institute in March. In another successful report from the Rabat/WFN Teaching Visit Program, Dr. Boubacar Maiga reports on his experience from his one-year fellowship in clinical neurophysiology at University Mohamed-V in Rabat, Morocco.

Drs. Jon Stone, Ingrid Hoeritzauer, and Mark Hallett provide us with a brief, up-to-date, and authoritative review of the current thinking with regard to the classification, pathophysiology, diagnosis, and management of functional neurologic disorders, including an invitation to learn and share more at the third International Conference on Functional Neurological Disorders to be held in September in Edinburgh. In this issue's history column, Dr. M.J. Eadie provides us with a historical view of the emergence of clinical neurology in Australia, and the key neurologic figures who contributed to this rich history.

You also will find the nice reports and descriptions from each of the four candidate city venues for World Congress of Neurology 2021. Each city also will be presenting (for voting by the Council of Delegates) at the upcoming World Congress of Neurology in Kyoto, Japan. Also in this issue is the announcement from the WFN Nominating Committee with regard to the listing of the candidates for WFN leadership and trustee positions to be voted on by the Council of Delegates in Kyoto. (Note: The statements from the candidates for president and vice president will appear in the upcoming [July/August] issue.)

Tissa Wijeratne, MD, provides an intriguing biographical sketch of his pathway and journey from the "jungle" of Sri Lanka to becoming a neurologist. Finally, Dr. Grisold and Robert Schmidhammer, MD, provide a heartfelt obituary for Dr. Hanno Millesi, a renowned peripheral nerve surgeon.

We sincerely hope that you will enjoy the many and varied contributions in this issue for and about neurology and neurologists around the globe. •

CANDIDATE NOMINEES ANNOUNCED

The WFN Nominating Committee announces the candidates for the following positions. The Council of Delegates will vote during the WFN elections at the upcoming World Congress of Neurology in Kyoto, Japan.

President
- Professor William M. Carroll, Australia
- Professor Wolfgang Grisold, Austria

Vice President
- Professor Ryuji Kaji, Japan
- Professor Renato J. Verdugo, Chile

Elected Trustee
- Professor Riadh Gouider, Tunisia
- Professor Man Mohan Mehndiratta, India

FUNCTIONAL DISORDERS

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by the Movement Disorders Society, will bring together neurologists, psychiatrists, psychologists, physiotherapists, and other health professionals to discuss semiology, mechanism, etiology, and treatment of the whole range of functional disorders seen in neurological practice over a three-day program.

Speakers will include Joe Jankovic, Tony Lang, Chris Goetz, Tony David, Markus Reuber, Valerie Voon, Marina Konig-Tijssen, Curt LaFrance, Mark Edwards, and Sir Simon Wessely. •

Jon Stone and Ingrid Hoeritzauer are from the Center for Clinical Brain Sciences at the University of Edinburgh in Edinburgh, Scotland. Mark Hallett is from the Human Motor Control Section of the National Institutes of Health in Bethesda, Maryland.

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The Need for a Global Neurology Alliance

Developing progress, while exciting, is creating problems that need to be addressed

BY W. (BILL) M. CARROLL, MB, BS, MD, FRACP, FRCP(E)

Recently, there has been an explosion of health awareness recognized by individuals, nations, and the global community. The decade of the brain was followed by the human genome project, accompanied by the near eradication of malaria and polio. Yet, we now stand at the threshold of even more rapid advances on many fronts.

W. (BILL) M. CARROLL, MB, BS, MD, FRACP, FRCP(E)

3-D printing of the human heart is being used in planning cardiac surgery. Next-genome sequencing is revolutionizing old concepts of disease. Gene therapy shows success in some inherited neuropathies (spinal muscular atrophy) and myopathies (Duchenne muscular dystrophy). Precision medicine is no longer an aspiration in some diseases and countries, and the ability to use publicly accessible data via expanding cloud technologies is yielding unexpected information and the repurposing of medications. Conversely, the cost of drug development, especially in bringing them to market, is becoming prohibitive, exacerbating the accessibility of therapies in many countries.

For the thoughtful and the less fortunate, it is obvious that the developing progress, while exciting and to be celebrated, is creating problems that need to be addressed. The increasing burden of non-communicable diseases (NCD) adds up to what can only be viewed as a potential tsunami for the economies of the world. These NCDs include mental (neurological) and substance-abuse disorders; musculoskeletal disorders; neurodegenerative conditions such as dementia, stroke and Parkinson's disease; poor lifestyle choices in diet and exercise; and the effects of unhealthy environments[1] together with the changing demographic of aging populations in so-called developed countries.

Those people and countries least able to afford the advances and/or mobilize services to adjust to them will see a widening gap, not only in these areas of disease but also in their ability to respond to the periodic recrudescence of infectious disease. This was seen with the outbreaks of Ebola, MERS, SARS, and, most recently, the Zika emergency. It is not by chance that the recent waves of mass migration have occurred as much because people seek better lifestyles (and health services) as fleeing armed conflict.

It is in this environment that those in the neurological fraternity need to mobilize and prepare measures at a number of levels that will mitigate the consequences of these changes. To begin, we must look at the magnitude of the problems facing us. Then, we will evaluate the resources we have available. Finally, we will view three illustrations of how those resources can be optimized to provide the organizational readiness for rapid and effective action as well as long-term planning on a national, regional, and global scale.

The Problem

The global burden of neurological disease figures as a relatively small fraction of the global burden of all disease (GBD) for a range of reasons[2]. Although not included in the WHO 2014 global status report on NCDs[3], stroke and dementia are of major concern to clinicians and national health systems.

The annual stroke toll is approximately 15 million, with one-third being fatal and another third permanently disabling. Indeed, stroke mortality is double that of HIV/AIDS, malaria, and tuberculosis combined, emphasizing the rising burden of brain NCDs. With rates of dementia estimated to triple from 47.5 million to 115 million worldwide by 2050[4], it is clear that the world faces a rising impost on resources.

Currently, the total burden of mental, neurological, and substance abuse (MNS) is now reckoned to be 258 million disability-adjusted life years — a measure of overall disease burden expressed as the number of years lost due to ill health, disability, or early death. That is up from 182 million in 1990, which has been equated to a $8.5 trillion (U.S.) loss of economic value now, and which will increase again by a factor of two by 2030[5].

With the addition of other NCDs to stroke and dementia, it is clear that the world neurological fraternity must act in concert and alert governments. Those other NCDs include age-related Parkinson's disease and other chronic neurodegenerative disease, perinatal injury largely due to asphyxia, childhood developmental and degenerative disease, schizophrenia, high levels of traumatic brain disease, all causes of epilepsy, substance and alcohol abuse, and rising neuroinflammatory disease of the brain and spinal cord.

While world neurological expertise has been steadily advancing partly in parallel with the recognition of the increasing challenges on the horizon and partly with the advances in medical science, it is far from equitably distributed. When the widening gap between well-developed countries with comprehensive health care and those less developed populations and health care systems is appreciated, the likelihood for an emergency is evident[6].

Resources

There are a number of valuable resources available. These include measures of the GBD and specific problem areas, such as the NCDs, BNCDs, and MNSs, as well as WHO monitoring for more acute challenges to health through national health departments and WHO's regional structural organization. (The WHO regional organization mirrors approximately that of the WFN). The periodic assessments of the GBD by the WHO and the Atlas of Neurology (a joint WHO-WFN project) provide the broad sweep, big picture view of resources and needs.

The WFN itself plays an important and growing role in the equalization of access to neurological care both through regional organization support and neurological education. The establishment of the African Academy of Neurology (AFAN) and its first meeting in Tunis this year are illustrative. It joins the expanding roles of other WFN regional organizations, including the Pan American Federation of Neurological Societies (PAFNS), the Australasian and Oceanian Association of Neurology (AOAN), the Pan Arab Union of Neurological Societies (PAUNS), the American Academy of Neurology (AAN), and the European Academy of Neurology (EAN).

Neurological training, the improvement in access to neurological care, and an increasing awareness of the importance of brain health in the general population are furthered by World Brain Day (WBD)[7] and the biennial World Congress of Neurology (WCN). The WFN, in partnership with AFAN, has followed the World Federation of Neurosurgical Societies (WFNS) program to train young African specialists. The WFN plans to have four regional training centers in Africa — two each for the Francophone and Anglophone regions. Additional emphasis of

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World Brain Day 2017

Stroke is a brain attack: Prevent it and treat it

BY MOHAMMED WASAY, MD, AND WOLFGANG GRISOLD, MD

This year's World Brain Day commemorates the foundation of the WFN. The prior World Brain Day topics were aimed at epilepsy and dementia, and now it is aimed at stroke. We are partnering this time with the World Stroke Organization (WSO), which puts great global effort into the prevention and treatment of stroke.

The topics of this World Brain Day should be the awareness of stroke, the symptoms, the prevention, and the new evidence for optimized treatment. Neurorehabilitation is increasingly becoming important.

World Brain Day is supported by the Public Awareness committee jointly with the WSO to make this day a success. As in the previous World Brain Days, a special logo will be produced, as well as material for local use, which can be used with the regional societies. Prior to World Brain Day, a template for press mailings will be distributed to help the local organizations. Closer to World Brain Day, a webinar will be accessible and, with invited participants from the press, will spread the news.

Despite these activities and help, the success of World Brain Day depends on your local activities. Please make the World Brain Day your own, use all of the material we provide, and ask for more if needed. Experience has shown that this international day has created much press attention, but local activities and information make the difference.

Please involve patients, caregivers, the public, and interested patient groups who will be interested in this topic. Stroke care faces many global inequalities, in regard to infrastructure, care, and support!

Needless to say, we are eagerly awaiting your reports of your local events, so we can publish them in *World Neurology*. Also, please post your activities on social media. •

World BRAIN DAY
"Stroke is a Brain Attack - Prevent it and Treat it"

WFN
WORLD FEDERATION OF NEUROLOGY

World Stroke Organization

The State of Neurology in Aleppo

Patient treatment in war-torn Aleppo suffered, but is struggling to return to normalcy

BY DR. MOHAMMAD BASSAM HAYEK

Aleppo, Syria, was subjected to a comprehensive war that directly affected all of its humanitarian services. Before July 2012, the difficulties were limited, with most related to security and transport problems.

However, by the end of July, the city had been torn into two large sections. With daily bombardments and clashes, the city's population plummeted from 4.5 million to 1.5 million. Coinciding with this, the city experienced a complete absence of electricity, a severe decline in health services, and an insufficient number of beds available for hospitalization of stroke patients in government hospitals.

A hospital with 40 beds, built in 1943 and rehabilitated in 2014, has a physiotherapy and rehabilitation department with an EEG machine.

The quality of service provided by the private sector decreased. No MRI device was in service, either in the governmental or private sectors. Seventy percent of the CT machines no longer worked.

A number of neurologists (about 12 out of 30 doctors) left because of the security chaos. There were no neurologists in the area controlled by the armed people. Patients had to travel for several days to see a neurologist.

This was accompanied by the interruption of the supply of most neurological drugs from local markets, especially antiepileptics (valproate, carbamazepine, and phenytoin) and all antiparkinson drugs.

In addition to the unavailability of the necessary anticoagulants for stroke, one of the most important challenges was the loss of records for the treatment of multiple sclerosis (MS). About 900 patients had been periodically reviewed for free medical service and treatment (interferon beta of all kinds). Patients were dispersed, some migrated, and others had new attacks without finding the right medication (methylprednisolone) or the correct diagnosis.

A workshop about epilepsy was presented during a training course funded by the World Health Organization.

All physiotherapy services disappeared. Although there were a number of therapists, the work was futile.

Due to the many injuries associated with shrapnel and peripheral nerve trauma, neurophysiologists for electromyogram and nerve conduction velocity tests were needed. There also was the occurrence of a number of cases of flaccid paralysis, and it was difficult to find treatment.

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ALLIANCE

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WFN involvement at a global level was given by WFN President Raad Shakir as chair of the Neurosciences Topic Advisory Group for the WHO-sponsored International Classification of Disease (ICD-11), due for release in 2018.

More generally, other areas are developing, which will enhance the ability to respond to challenges. Increasingly rapid communication through electronic media, including social media, draws attention to emerging problems. The maturation and expanding expertise of neurological subspecialties and their involvement in wider educational activities (e.g. the International League Against Epilepsy, the World Stroke Organization, and the Movement Disorders Society) as well as the added interest of the larger regional neurological organizations, such as the AAN and EAN, provide a rich resource of intellectual and monetary capital.

Over the last few years, the WFN has provided a focal point for those involved in the medical care of neurological disease through two similar, though importantly different, groups. The first is the World Brain Alliance (WBA). Originally chaired by Vladimir Hachinski, MD, when he was WFN president, it is now chaired by Dr. Shakir. The WBA members include, in addition to the WFN, global organizations that usually do not include neurologists, such as the WFNS, the International Brain Research Organization (IBRO), the World Psychiatric Association (WPA), the International Child Neurology Association (ICNA), and the World Federation of Neurorehabilitation (WFNR). The second group is the Global Neurology Network (GNN) for which the WFN is the current convener and whose members mainly include neurological disease-specific organizations from around the world. Many were originally part of the WFN but have grown to be independent organizations. They include the World Stroke Organization (WSO), the International League Against Epilepsy (ILAE), the Multiple Sclerosis International Federation (MSIF), the Treatment and Research in Multiple Sclerosis (TRIMS) Group, Alzheimer's Disease International, the Movement Disorder Society, the International Headache Society, the International Society for Clinical Neurophysiology, the Peripheral Nerve Society, and the Tropical Disease Group. Closely associated with this category of disease-specific organizations are both large regional organizations supporting all neurological subspecialties, such as the AAN and the EAN, and the smaller WFN-affiliated regional organizations, such as the AOAN, PAUNS, PAFNS, and AFAN.

> The most critical function of a global alliance of neurological organizations is the ability to formulate, organize, and execute rapid and effective policy or reaction.

Together, these two groups create an impressive global alliance of neurological expertise. It is an alliance appropriately suited to provide global disease-specific advice to international organizations, such as the WHO and the U.N., and to advocate with these organizations and national governments. It is an alliance worthy of the term Global Neurology Alliance.

Recent Examples of United Action

The most critical function of a global alliance of neurological organizations is the ability to formulate, organize, and execute rapid and effective policy or reaction. A powerful advocacy initiative that can mobilize governments and NGOs is of enormous value to those under threat, and it is the rapidity of communication and the common understanding of the advocating group that empower these initiatives as a force for good.

Underlying this ability are two fundamentals. The first is an intimate understanding by the subspecialty organization in the national, regional, and global spheres of all matters affecting practitioners and patients. The second is the intercommunication among the various subspecialty organizations facilitated by the GNN. Regular meetings, updates on activities, and a common understanding of the means to reach their constituencies contribute to the effectiveness of the network.

Recent examples of where this alliance has been called to mobilize and has proven its worth are the 2015 Zika virus outbreak, the WHO initiative on NCDs, and the crisis over the WHO classification of stroke as a circulatory rather than neurological disease.

The outbreak of the arthropod-borne (Aedes aegypti) Flavivirus crisis, known as Zika virus, in April 2015 in Brazil, was designated by the WHO in February 2016 as a public health emergency of international concern (PHEIC)[8].

Zika was first found in Uganda in 1947, and the first outbreak of disease occurred in Micronesia in 2007. The South American outbreak was much worse. The primary infection was often asymptomatic or relatively banal, comprising arthromyalgia, a light rash, or a low-grade fever. The major secondary effects were of brain neuronal migration injuries to the fetuses of pregnant women manifesting often, but not solely, as microcephaly, and a postinfectious neuropathy resembling Guillain-Barré syndrome.

Given the unknowns with this outbreak

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IN MEMORIAM

Hanno Millesi

March 24, 1927-April 28, 2017

BY ROBERT SCHMIDHAMMER, MD, AND WOLFGANG GRISOLD, MD,

University Professor Dr. Hanno Millesi, a doyen of modern nerve surgery, died April 28, 2017, in Vienna, Austria. He was 90.

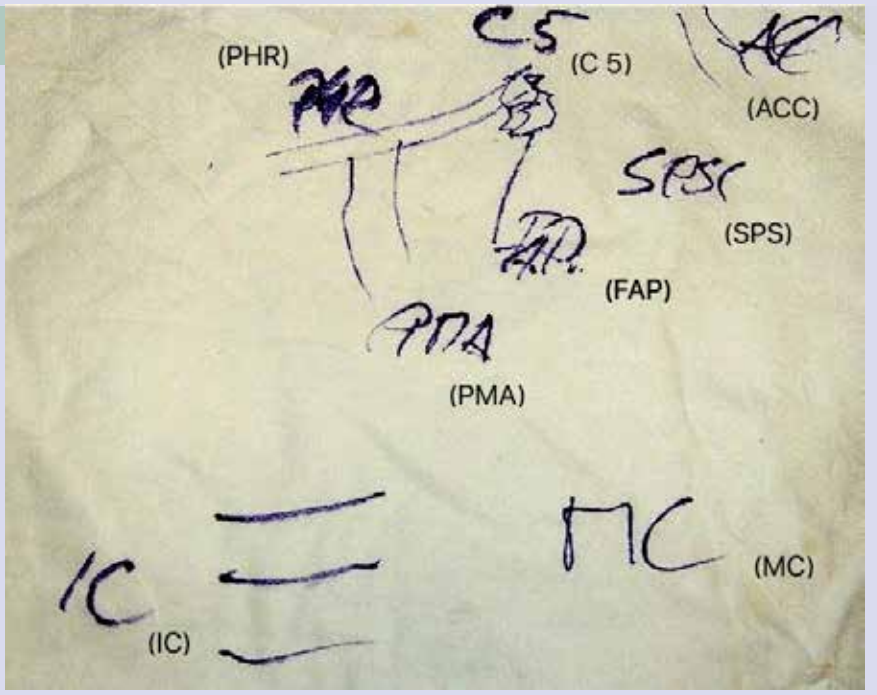
Dr. Millesi was born in Austria in 1927. He finished his medical studies in Innsbruck in 1951, and started his career in surgery at the University of Vienna. He was one of the founders of plastic and reconstructive surgery in Austria, and chaired the department at the University of Vienna until his retirement in 1995. He has a long list of international achievements, including being a member of the Sunderland Society, the International Society for Reconstructive Microsurgery, and the World Society for Reconstructive Microsurgery. He has a long list of publications and books, and was actively involved in peripheral nerve research until his death.

Dr. Hanno Millesi

Dr. Millesi had an eminent interest in surgery of the peripheral nerves, and was one of the pioneers in using autologous nerve transplant, which revolutionized the concept of nerve repair. He also developed the methodology of microsurgical neurolysis, which aims to decompress nerve fascicles.

He remained active in the field of research until his death. In his last years, he was devoted to tissue and environment of peripheral nerves, in particular nerve gliding. Increasingly, he incorporated the new imaging methods, in particular high-resolution ultrasound, in his concepts.

Dr. Millesi was a dedicated physician, and was appreciated for his lexical knowledge and his ability to consult and advise. He was tireless with regard to patient issues and any aspects of peripheral nerve.



Original sketch of a complex reconstruction of the brachial plexus, by Dr. Millesi (approximately 2005). (PHR: Phrenic nerve; C5: nerve root with neuroma; ACC: Accessory nerve; PMA: pectoralis major muscle; FAP: Posterior fascicle, SPSC Suprascapular nerve, lines depict sural nerve grafts (transplants); MC musculocutaneous nerve; IC Intercostal nerves.)

Dr. Millesi was not only an excellent surgeon and scientist, but he also was a good example of collaboration between the fields of neurology and plastic and reconstructive surgery. His concepts of nerve surgery, re-innervation, and applied neuroplasticity taught neurology a lot. These concepts have advanced the knowledge of nerve repair and reconstruction from a static approach to a highly dynamic field. •

Robert Schmidhammer, MD, is a university professor at Millesi Center in Vienna. Wolfgang Grisold, MD, is WFN secretary general and a professor at Ludwig Boltzmann Institute for Experimental and Clinical Traumatology in Vienna.

ALLIANCE

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and the urgency to gather information, a committee, headed by John England, MD, was constituted, assisting the global investigation of the outbreak. The committee was supported by WFN resources through the regional organization in South America, the expertise within the organization, and the rapidity with which the WFN could respond to assist. PHEIC status was ceased in November 2016.

The NCD initiative, launched in 2011 by the WHO following the GBD report highlighting the impact of NCDs[9], concentrated on cardiovascular disease, cancer, diabetes, and respiratory disease. Omitted were major illnesses central to brain health, such as dementia and stroke. The omission was questioned by the global neurological fraternity. The WFN, through its role as WBA convener and led by Dr. Shakir, waged a campaign to have brain NCDs included in the initiative[5].

How did such a situation arise? It seems that because the WHO viewed stroke and dementia not to be brain diseases but rather as circulatory and mental disorders, respectively, they were not included as risks to brain health. There are historical reasons for this view, which were defended by the WHO, but ICD-11 brought this matter to a head. In doing so, it also provides an illustration of the value of a global neurological alliance.

The ICD is revised every decade. ICD-10 was adopted in 1990, and in 2007 the revision ICD-11 was commenced under the supervision of the Revision Steering Group, which took advice from a number of Topic Advisory Groups (TAGs). The ICD-11 Neurology TAG was constituted in 2011 under the leadership of Dr. Shakir. Soon after this process commenced, stroke was apparently accepted as a disease of the brain. When the beta version of ICD-11 was published in 2016, the neurological and stroke fraternities were astounded to find that stroke had been changed to a circulatory disease.

Clarity as to the reason stroke had been omitted from the NCD initiative had arrived. Stroke was not a brain disease. The decision galvanized the neurological and stroke communities. After considerable effort, it was determined that the powerful statistics group within the WHO had been at the forefront of the opposition to the change initiated by the Neurology TAG. While the grounds for such opposition were reasonable and based on a desire to obtain the best longitudinal epidemiological data, it effectively "hid" the impact of stroke in the global community and paid little heed to the growing evidence of the contribution of cerebrovascular disease to dementia and NCDs in general.

There followed initial correspondence to *Lancet*[10] by the WFN and WSO, and the formation of an ad hoc advisory group through the recruitment of national departments of health to voice opposition to the way stroke was handled by the WHO. A number of important face-to-face and telephone meetings took place, as well as a review of the evidence, from the WSO perspective, of why stroke should not be classified as only a circulatory disease. Through an innovation introduced in ICD-11, multiple parenting was possible. This, together with the weight of argument, has seen stroke, as of April 2017, classified as a cerebrovascular disease in the current beta version of ICD-11—an event described by many as momentous. *(See the President's Column on page 1.)*

Conclusion

It is no accident that these external initiatives of the WFN and partners have been successful. The ability to respond rapidly, to gather expertise, and to plan and implement the agreed approach, while maintaining the flexibility to adapt to developments, are the prime reasons. That there has been an immediate sense of shared purpose, and the acknowledgement that together we are better able to present the arguments firmly and authoritatively, has no doubt assisted. The foresight of the originators of these two groups has to be praised, as does the leadership of the current WFN president and the members of the WBA and GNN.

With the world facing continuing uncertainties, it is likely we shall see more reasons to be grateful for the contributions made by these groupings and to possibly have periodic joint meetings. In practice, these groups and their membership represent a truly global neurological alliance. •

W. (Bill) M. Carroll, MB, BS, MD, FRACP, FRCP(E), is first vice president of the WFN and is the WFN convener for the Global Neurology Network.

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WFN NSRG Examines Clinical Applications

Faculty reviews the current state of neurosonology and specific clinical applications

BY MARINA ALPAIDZE, MD, PHD, AND ALEXANDER RAZUMOVSKY, PHD, FAHA

The WFN Neurosonology Research Group (NSRG) is dedicated to the promotion of science and research as well as education and training in the field of ultrasonic techniques (carotid duplex and transcranial Doppler) and their clinical utilization. Therefore, international cooperation and the dissemination of scientific information within the field of neurosciences and neurosonology is part of the WFN NSRG activities.

On Oct. 22, 2016, the Georgian Chapter of the WFN NSRG successfully conducted its third regional meeting in Tbilisi, Georgia. The meeting included participants from the neighboring country of Azerbaijan. The one-day course was designed for individuals who are interested in performing and interpreting neurosonology studies.

The faculty discussed the current status of neurosonology and specific clinical applications, such as its clinical utilization on patients with dementia or an undetermined etiology of stroke. Relatively new aspects of neurosonology applications were discussed for patients with neuromuscular disorders and consequences of traumatic brain injury. Well-known neurologists and neurosonology experts delivered the lectures. These individuals included:

- Marina Alpaidze, MD, of Georgia, president of the WFN NSRG Georgian Chapter and president of Georgian Society of Neurosonology and Cerebral Hemodynamics
- Eva Bartels, MD, PhD, of Germany, vice chair for International Certification in Neurosonology
- Natan Bornstein, MD, PhD, of Israel, vice president of the World Stroke Organization and president of the European Society of Neurosonology and Cerebral Hemodynamics
- Aleksandr Dzhanashvili, MD, PhD, of the United States
- Tamar Janelidze, MD, PhD, of Georgia
- Alexander Razumovsky, PhD, FAHA, of the United States, secretary of the WFN NSRG
- Ekaterina Titianova, MD, PhD, DSc, of Bulgaria, president of Bulgarian Society of Neurosonology and Cerebral Hemodynamics

Participants at the third regional WFN NSRG meeting. (From left) Aleksandr Dzhanashvili, MD, PhD; Eva Bartels, MD, PhD; Ekaterina Titianova, MD, PhD, DSc; Natan Bornstein, MD, PhD; Alexander Razumovsky, PhD, FAHA; and Marina Alpaidze, MD.

This third Georgian meeting was guided and directed under the auspices of the NSRG of the WFN and accredited by the Tbilisi Medical University Continuing Medical Education (CME) Board for 10 CME hours. •

STROKE

continued from page 1

disease of vessels. Statisticians, following the principle of ascribing disorders to their basic etiology, followed this procedure, ignoring the fact that all of the effects of CVDs are neurological and that the initial interaction of the neurovascular bundle is fundamental to the pathophysiology. Moreover, in ICD-10, other ischemic disorders affecting the eyes, bowels, and kidneys fall under the affected organs. Transient ischemic attacks were classified under episodic disorders separate from CVDs.

This situation is not only incorrect, but it has led to massive confusion of reporting the fact that a leading cause of death is not placed as a disease of the brain. The first act the TAG performed was to contact and agree with our cardiology colleagues as cardiac events were lumped with CVDs, skewing their statistics as much as ours. They were asked to approve a total separation of cardiac and brain diseases for the benefit of both. This was successfully established with the Cardiology TAG in 2011. It, of course, remains that cardiogenic causes of CVDs are appropriately reported in both sections.

Where to Place CVDs?

The WHO statisticians were informed, and we had "initial acquiescence" until the middle of 2016, when a major statistician's review of ICD-11 was carried out by the WHO Department of Informatics and Statistics. At that time, statistics advisers had second thoughts, which again placed all CVDs under the circulation section of the Joint Linearization for Mortality and Morbidity section of ICD-11.

This decision needed to be reversed, which required intensive lobbying to make the point that stroke is a brain disease. It has to be emphasized that the ICD is "owned" by the WHO statisticians, and our role as clinicians is advisory.

Be that as it may, the TAG had to pursue this matter vigorously and provide the scientific reasoning for the change. WFN and the World Stroke Organization (WSO) acted in a closely coordinated manner. Professor Bo Norrving, past president of the WSO, and I, the representatives of the Neurology TAG, used all possible avenues to make the case for the WHO Department of Informatics and Statistics. In addition to the production of scientific evidence on the etiology of stroke and the interactions between vessels and brain parenchyma, we needed to mobilize other players to reinforce the message of the importance of stroke being classified as a brain disease for resource allocation and training of staff—medical, nursing, and others—to combat the scourge of CVDs.

The issue is vital for the future of neurology, and *The Lancet* published two letters, one from us[1], and the second a reply from the WHO Department of Informatics and Statistics[2]. We had put forward the argument for stroke moving to the central nervous system, while the ICD

see **STROKE**, *page 8*

ALEPPO

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Turning the Corner

In January 2013, life was unbearable, and the city seemed to be gloomy without electricity or water, along with the decline of all basic services.

By 2014, a road to the city opened, bringing supplies to the besieged population. Small, private generators within neighborhoods delivered a limited supply of electricity. An MS committee was reorganized, and up to 365 patients were treated for free with beta interferon, but the drugs were from generic companies.

Initially, one MRI was returned to service. In the private sector, three private devices are now operating. However, there are no devices in government hospitals that can be used for free. The average cost of providing an MRI is $60. (The average monthly salary is $100.)

With the passing of time, the service situation stabilized, and the security improved. The U.N.'s international organizations reached the city and helped improve the health system.

A hospital features an environment that helps stimulate recovery by emphasizing a water flat, gardens, and outdoor activities.

Since mid-2014, medicine has become available in an acceptable, but insufficient manner. Currently, most essential neurological drugs are available. The most important are antiepileptic drugs (carbamazepine, sodium valproate, lamotrigine, levetiracetam, and clonazepam), but the supply is unstable. There are still difficulties in securing antiparkinson drugs, especially levodopa.

Continuing medical education and training have declined. The health sector has not prioritized the provision of services.

However, there have been improvements since 2015. The road from Aleppo to Damascus has become safer. Scientific activity has slowly returned, but fear still prevails over some doctors.

Some of the government hospitals are open, including a free neurology clinic at Ibn Khaldoun Hospital. There is free EEG service at three locations, and rehabilitation at one of the public hospitals is open to neurologic patients.

Training of neurologists of all ages is still an important need. This can be accomplished in seminars, scientific conferences, and specialized training programs. Neurological drugs through the World Health Organization are still needed. •

Dr. Mohammad Bassam Hayek is a neurologist in Aleppo, Syria. He is vice president of the Syrian Society of Neurosciences and general director of Ibn Khaldoun Hospital.

STROKE

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classification team put forth its reasoning, quoting continuity and the fact that CVDs were placed in ICD-7 in 1955.

This meant going to governments, as they are the ultimate power in the WHO structure. We are most grateful for the support, such as a most powerful letter from Veronica Skvortsova, the minister of Health of the Russian Federation, addressed to the WHO director general. Dr. Skvortsova is herself a neurologist and therefore is fully aware of this anomaly in ICD-10. We also are most indebted to the health ministries of Austria and New Zealand for their support.

We were hugely supported by patient organizations that wrote to the WHO and to neurologists from across the world for their support. Following all of this effort, a request came from the ICD classification team asking us to have another face-to-face meeting. This was conducted Dec. 21, 2016, in Geneva. The daylong meeting was most interesting as it started with the assertion of the statisticians on the importance of continuity and stability of statistics over decades. This is something crucial to us all. However, explanations were provided with regard to the need for radical change and why it is crucial to rectify a previous anomaly. The WHO technical department where neurology sits was represented by Dr. Tarun Dua, who made the case for the need to place CVDs under the nervous system diseases chapter of the ICD-11. The Neurology TAG was represented by Dr. Norrving and me. The meeting ended without an immediate outcome. We did not know the meeting's conclusions for more than three months. The WHO ICD team had to clear its decisions with its statistics consultants from around the world. This is perfectly understandable as many computer systems have to be retuned, and this will need time and finance.

Two further medical statistics meetings took place. Finally, on March 31, I was informed by email: "The grouping 'Cerebrovascular Diseases' has moved into 'Diseases of the Nervous System.'" This is a culmination of eight years of work and is the most logical outcome for our endeavors.

Now the world of neurology is correctly represented. This is immediately reflected in the soon-to-be-published "Global Burden of Disease" paper, where in 2015 "neurological disorders rank as the leading cause group of DALYs (disability-adjusted life years) and the second-leading cause of death in the world." This means that resources will be appropriately allocated not only for CVDs but all neurological disorders. The WHO decision was truly momentous, and for that we are grateful. Stroke is back where it belongs. •

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CANADIAN DEPARTMENT VISIT PROGRAM

From Brazil to Montreal

WFN and the Canadian Neurological Society provide an observer learning opportunity at MNI

BY GIORDANI RODRIGUES DOS PASSOS, MD

One month after completing my neurology residency in Brazil, I had the opportunity in March to participate in the Canadian Department Visit Program, during which I served as an observer at the Montreal Neurological Institute (MNI).

The administrative staffs of the WFN and the MNI were excellent, both before and during my stay in Montreal. My schedule was arranged by Dr. Anne-Louise Lafontaine, who made sure to take my main interests into account.

My activities included:

- Clinics of multiple sclerosis (MS), amyotrophic lateral sclerosis, neuromuscular disorders, and movement disorders at the Montreal Neurological Hospital (MNH) for three weeks
- Neurology wards and consultation at the Montreal General Hospital (MGH) for one week
- Weekly grand rounds and teaching sessions at both the MNH and the MGH
- Weekly meetings with the PET team at both the Brain Imaging Center/MNH and the Douglas Institute
- Meetings with professors and PhD students to discuss specific areas of interest

My main interest is MS, which is roughly 10 times more prevalent in Canada than it is in Brazil. From a clinical perspective, this observership was remarkable because I saw several dozen MS patients, covering a wide range of clinical aspects and treatment strategies.

A number of elements stood out for me relating to the functioning of the MNI and the health care system in Canada. They included:

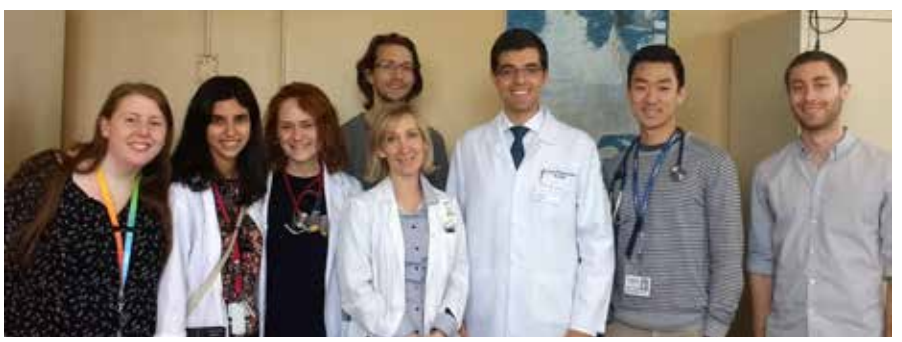
- Health care and research are closely integrated with mutual benefits.
- The MNI is remarkably able to communicate its actions and achievements to the scientific community as well as the patients and society as a whole. This increases its ability to raise additional funds for research.
- Multidisciplinary teams at the clinics and in the wards improve significantly both the neurologists' work and patient outcomes.
- Canadian neurology residents receive more in-depth training on neuroanatomy, pathophysiology, and semiology than most of their Brazilian counterparts.

Many of these elements could be implemented in my workplace, an 800-bed university hospital in southern Brazil. What I learned at the MNI will improve my practice as a neurologist and researcher in the coming years. It also will serve as a lesson when I have opportunities to participate in my hospital's institutional decisions.

A minor drawback of my observership was the March break, which took place during my first couple of weeks there. During this time, some of the clinic's work was suspended, and some of the attending neurologists were away from the hospital. Even though I was able to find alternative clinical or academic activities to fill my schedule, I suggest the next observers be advised of the March break and encouraged to choose another month for their MNI visit.

Overall, this was an inspiring, career-changing experience. I recommend the Canadian Department Visit Program for other young neurologists. I congratulate the WFN, the Canadian Neurological Society, and the MNI for fostering education in neurology, and I am grateful for this opportunity. •

Giordani Rodrigues dos Passos, observer (left), Mrs. Vanessa Spyropoulos, clinical nurse specialist in the MS program, and Dr. Yves Lapierre, director of the MNH Multiple Sclerosis Clinic.



Dr. Anne-Louise Lafontaine (center), chief of the Department of Neurology of the McGill University Health Center, and Giordani Rodrigues dos Passos (third from the right), observer, with neurology residents and medical students during rounds at the Montreal General Hospital.

Giordani Rodrigues dos Passos, MD, works in the Department of Neurology at São Lucas Hospital in Porto Alegre, Brazil.

Dr. Jack Antel (left), professor at McGill University and president of the Americas Committee for Treatment and Research in Multiple Sclerosis, and Giordani Rodrigues dos Passos, observer, at the Montreal Neurological Hospital.

MOROCCO DEPARTMENT VISIT PROGRAM

Fellowship in Morocco Productive for Mali Neurologist

BY DR. BOUBACAR MAIGA

I would like to thank the WFN for giving me the opportunity to have a fellowship in clinical neurophysiology at the University Mohamed-V in Rabat in Morocco. I would like to express my sincere gratitude to Prof. Mustapha El Alaoui Faris, the coordinator of the Rabat Center, for his advice and follow-up during my successful training. I also thank Prof. Reda Ouazzani, the head of the Department of Clinical Neurophysiology, for his warm welcome and nice teaching. I also thank the department team: Profs. Nazha Birouk, Halima Belaidi, and Leila Errguig, and Drs. Fatiha Lahjouji and Bouchra Kabli.

My training took place every week, from 9 a.m. to 3 p.m., Monday through Friday. I performed all of the neurophysiological explorations under the supervision of Prof. Ouazzani. In the department, I had the same activities as the Moroccan residents in neurology and neurophysiology.

Photo of the staff of the Department of Neurophysiology of Mohamed-V University of Rabat Sitting (from left): Prof. Halima Belaidi, Dr. Fatiha Lahjouji, and Prof. Nazha Birouk. Standing (from left): Dr. Bouchra Kably, and Profs. Alassane Dravé, Youannes Debebe, Boubacar Maiga, Fatima Hassane Djibo, Reda Ouazzani, and Leila Errguig.

PATHOLOGIES FREQUENTLY ENCOUNTERED

Video EEG
- Drug-resistant epilepsy
- Psychogenic non-epileptic seizures

EMG
- Carpal tunnel syndrome
- Myopathies
- Motor neuron diseases
- Polyneuropathies
- Neuromuscular junction disorders
- Radiculopathies

- Video EEG: I participated in the recording, reading, and interpretation of video EEGs for patients with epilepsy. I interpreted the EEGs alone at first, and then I discussed the EEG patterns with one of the professors in the department.
- EMG: Initially, I practiced EMG under the supervision of the professors. Then, I practiced EMG alone and discussed the protocol and patterns with one of the professors in the department.
- Evoked potential exploration: I did time-to-time evoked potentials with Dr. Kably.
- Neuromuscular outpatient visits: I regularly attended the outpatient consultations on neuromuscular diseases with Prof. Birouk.
- Epileptology: I attended the epileptology consultations with Profs. Ouazzani and Belaidi.

The first six months were focused on EEG and epilepsy, and the focus in the last six months was on EMG and neuromuscular diseases.

Scientific Activities

I attended the departmental conference from 2:30 to 4 p.m. on Thursdays. There, we discussed interesting EMG and EEG cases selected from Monday through Wednesday. The last Friday of every the month, we held a multidisciplinary conference in the morning involving all of the neurology departments of the hospital. An oral presentation was made by each department, and the presentation was debated. In the afternoon, we had a multidisciplinary conference that included neurologists, neurosurgeons, and neuroradiologists at the National Center of Neurosciences and Rehabilitation inside the hospital Hôpital des spécialités.

Congresses and Meetings

With the support of the Moroccan Society of Neurology, I had the opportunity to attend the following meetings and congresses:
- May 5-7, 2016: The National Congress of the Moroccan Society of Neurology in Marrakesh
- May 19-21, 2016: The Maghreb Congress of Neurology in Alger
- Oct. 13-15, 2016: The course on Movement Disorders, organized by the Movement Disorders Society and the Moroccan Association of Movement Disorders in Marrakesh.
- Nov. 10-12, 2016: The Autumn Congress of the Moroccan Society of Neurology in Rabat. At the conference, I received an award for the best poster communication.
- March 15-18, 2017: I presented an oral communication, "Phrenic Nerve Conduction Study in Six Patients With Amyotrophic Lateral Sclerosis and Review of the Literature," at the African Academy of Neurology Conference, in Hammamet, Tunisia.
- March 28-31, 2017: Les Journées de Neurologie de Langue Française, the annual French meeting of neurology, in Toulouse.
- April 27, 2016: I attended a course of Prof. Fabrice Bartolomei from Marseille on epilepsy and sleep.
- I attended two seminars for residents of anatomy and physiology of the nervous system, organized by Faculty of Medicine of Rabat.
- March 10-11, 2017: I attended an EMG Practical Workshop on Traumatic Nerve Injuries, animated by Prof. Emmanuel Fournier of Paris and Prof. Nazha Birouk of Rabat, in Marrakech.

To enhance my knowledge on the theoretical level, I enrolled in the University Diploma on EMG and on EEG.

I am satisfied with my fellowship in the Department of Neurophysiology at Rabat. Thank you for the scientific environment and the availability of the whole team of the department. I had an excellent stay in Rabat, during which I gained knowledge in both EEG and epileptology, as well as in EMG and in neuromuscular diseases.

> "I believe I will be able to pass on the knowledge in neurophysiology that I acquired in Rabat to my colleagues in Mali and help improve the practice of neurophysiology in my country."
>
> **Dr. Boubacar Maiga**

I believe I will be able to pass on the knowledge in neurophysiology that I acquired in Rabat to my colleagues in Mali and help improve the practice of neurophysiology in my country.

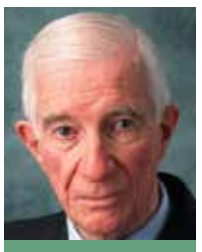
I am planning to use EEG and EMG at the teaching hospital of Point G to support the clinical evaluation needs of patients with epilepsy. I will do an EEG evaluation of study participants in a research project on autism in Mali. I am currently designing a study on EEG biomarker identification in autistic children. •

The Emergence of Clinical Neurology in Australia

A review of the work of five key authors who paved the way for the specialty in the Commonwealth.

BY M. J. EADIE

In Northern Hemisphere countries, from about 1860 onward, the specialty of clinical neurology emerged after increasing numbers of medical graduates focused their interests and restricted their clinical practices to the study and management of organic disease of the nervous system. A similar process occurred in Australia, but lagged by some four decades so that the specialty of clinical neurology there became firmly established only by the mid-20th century.


M. J. EADIE

Several factors contributed to the Australian delay. European migration to the country began in 1788. Initially, the migration was composed largely of convict settlements, with free settlers beginning to arrive a few decades later. The Australian population sites that developed were far from Northern Hemisphere cities and educational institutions and also were considerable distances from each other. The individual sites needed to become large enough before specialist medical practice was feasible in them.

In the latter third of the 19th century, accounts of neurological disorders peculiar to Australia began to emerge. For example, children were being diagnosed with lead poisoning, and those who ate finger cherry fruit experienced acute bilateral visual failure. There were reports of disorders, such as leprosy, beriberi neuritis, and tick bite paralysis, not often seen in temperate climates. With few exceptions, Australian authors did not publish again on the same topic.

However, in the 1880s in Melbourne, John William Springthorpe became interested in epilepsy, and in the 1890s, S. Jamieson wrote on both syphilis and peripheral neuritis.

George Edward Rennie

The first man to take a major continuing interest in clinical neurology in Australia was George Edward Rennie (1861-1923). Originally from Sydney, he received his medical education (MB and MD) at the University College London and returned to Sydney. By 1898, Dr. Rennie became an honorary physician to the Royal Prince Alfred Hospital. He resigned that appointment and returned to London. He took the membership of the Royal College of Physicians, returned to Sydney in 1900, and re-ascended the honorary consultant ladder at his hospital to become its senior physician (from 1912 to 1921).

Dr. Rennie seems not to have carried out any significant original research, but wrote on neurological topics, such as the functional anatomy of the cerebellum, meralgia paraesthetica, the physiology of voluntary movement, the curability of epilepsy, the treatment of peripheral nerve diseases, the effects of spinal cord transection, and the possibility that occupation and peripheral trauma might determine the site of syphilitic cerebral pathology. He provided the neurological input to the main teaching hospital of Australia's largest city but, with writings on topics such as pneumonia, tuberculosis, pernicious anemia, childhood deafness, and endocrine topics, he never restricted his activities to clinical neurology.

Alfred Walter Campbell

Alfred Walter Campbell (1868-1937) was the first person in Australia to practice purely as a clinical neurologist. He was born on a pastoral property in southern New South Wales, educated locally, and, at the age of 18, traveled to Edinburgh, Scotland, for medical studies. He graduated with an MB CM in 1889.

After short-term appointments in British psychiatric institutions and some months in Vienna with Richard von Krafft-Ebing, he spent a year at the State Asylum in Prague, where his histological research on "alcoholic neuritis" brought him an Edinburgh MD degree in 1892. He then became medical officer and resident pathologist at the Lancaster County Asylum (Rainhill), near Liverpool, where he spent the next 13 years publishing a considerable amount of neuropathological investigation into various topics, such as the degeneration of spinal tracts connected to the cerebellum. He was the sole author of all of this work, except for a lengthy account of the pathology of herpes zoster, co-authored with (the subsequently Sir) Henry Head. Head supplied the clinical data to correlate with Dr. Campbell's histological findings in the nervous systems of 21 zoster sufferers. A map of the distribution of the human dermatomes resulted. Dr. Head's role in this great achievement is still remembered, while Dr. Campbell's is forgotten.

From about 1900 on, Dr. Campbell systematically investigated the histology of the entire normal human cerebral cortex, as a preliminary to searching for histological changes in the cortex that might correlate with mental illness, something that macroscopic pathology had failed to do. He studied serial sections from tissue blocks from 50 to 60 gyri per hemisphere in five hemispheres, staining alternate sections for myelinated nerve fibers and neuronal cell bodies, and in a further three hemispheres for nerve fibers only. He also sought retrograde cortical histological changes where altered brain function resulted from lesions below the cortex. He identified 12 histologically distinct areas in the cerebral cortex.

The future Nobel Laureate C.S. Sherrington, then professor of physiology in nearby Liverpool, read the findings on Dr. Campbell's behalf to the Royal Society of London (1903 and 1904). The abstracts appeared in the society's *Philosophical Transactions,* but the full paper was too extensive for publication. The society regarded the work highly enough to subsidize its publication by Cambridge University Press as *Histological Studies on the Localization of Cerebral Function.* The monograph appeared in late 1905, some three years before Korbinian Brodmann's similar investigation was published.

Alfred Walter Campbell (left) and Leonard Bell Cox.

Before his monograph was in print, Dr. Campbell returned to Australia, never leaving his homeland again except to serve with the Australian Army Medical Corps in Egypt during World War I. One factor in his abandoning his British career at his moment of triumph probably was his 1906 marriage in Sydney to a woman he had known since his rural childhood.

In Sydney, neuropathology was largely closed off to him by Froude Flashman and Oliver Latham in the State Asylum Service, while Dr. Rennie did much of the clinical neurology. Dr. Campbell began consultant practice in a mix of neurology and neuropsychiatry, with the latter progressively fading from his activities. He held honorary consultant positions at the Sydney Children's and Coast Hospitals, and after World War I, to the Repatriation Department. He continued some neuropathological work, studying a gorilla brain given to him by Dr. Sherrington, and investigating in conjunction with Cleland the pathology and pathogenesis of a viral encephalitis termed Australian X disease, now believed to have been Murray Valley encephalitis. He also sought histological evidence consistent with localization of function in the human and Australian animal cerebellar cortex. He published those findings in so obscure a site that they went almost entirely unnoticed.

His other papers in Australia were more clinical. In 1937, he became ill with a malignancy, dying late in that year. He left behind no local school of clinical neurology. Sydney medicine, long reluctant to accept specialization within internal medicine, was not ready for it. Dr. Campbell's reserved personality probably worked against him, and his earlier scientific attainments were little appreciated in his homeland.

J. Froude Flashman

J. Froude Flashman (1870-1917) followed a career course similar to Dr. Campbell's. In 1910, he moved from neuropathology into consultant neurological and pathological practice in Sydney, largely to provide for his family. His original contributions to neuropathology, though appreciable, were not of the magnitude of Dr. Campbell's. Dr. Flashman died of pneumonia while serving in the Australian Army Medical Corps in 1917 in France, soon after taking the MRCP qualification. Unfortunately, he did not have time to influence the development of Australian clinical neurology.

Leonard Bell Cox

A young Melbourne medical graduate, Leonard Bell Cox (1894-1976) took the Edinburgh MRCP qualification (in hematology) before returning home after front-line service in France during World War I. In Melbourne, he first held appointments in pathology while building up practice as a physician. From 1925 onward, he increasingly devoted himself to clinical neurology, holding a formal appointment as a neurologist to the Alfred Hospital in that city. Among other investigations, he published some significant neuropathological research, including a major and influential study, "The Cytology of the Glioma Group With Special Reference to Inclusion of Cells Derived From the Invaded Tissue," that appeared in the *American Journal of Pathology* (1933), and a co-authored monograph (with Jean Tolhurst) on *Human Torulosis*.

Edward Graeme Robertson

With the advent of Dr. Cox, leadership in the development of Australian clinical neurology shifted from Sydney to the country's second city, Melbourne. There, (Sir) Sydney Sewell (1880-1949) held hospital consultant neurological appoint-

see **AUSTRALIA**, *page 12*

From Jungle to Metropolis

The journey of one neurologist from Sri Lanka to Melbourne

BY TISSA WIJERATNE, MD

Born and raised in what I describe as "the jungle," my life started in one of the remotest parts of Sri Lanka: a village called Kirioruwa-Bandarawela in the central mountainous area. Electricity, hot water, television, and telephone were all miles away from us at the time.

I fondly recall days spent reading in the shade of a tree in the rice fields that surrounded my family home — the place where sky and earth met, almost kissing each other daily. The mountains were covered with a layer of lush tea bushes. Our home sat on the top of one of these mountains.

As a young boy, I would spend hours reading my favorite magazine, the *Mihira*, a children's weekly.

Fast forward several decades. I am now the director of stroke services, neuroscience research unit, director of academic affairs, and director of international affairs at a leading public health service and a leading academic institution in Melbourne, Australia. I have just been appointed to chair of the Department of Neurology at Western Health in Australia to promote better brain health through my leadership.

I have become the first Sri Lankan-born neurologist to lead an academic department of neurology in Australia.

Tissa Wijeratne, MD (right), with one of his mentors from his time as a student in Sri Lanka.

The Journey

I was always dreaming, ravenously reading, thinking … trying to discover new things that others hadn't, with a view to make life better for my fellow men and women.

I fell in love with the idea of medicine when I realized that the potential to change human life for the better was immeasurable.

I was accepted in to medical school at the University of Peradeniya in 1987 as a merit student. This was purely an accident. I had no idea that I could end up in medical school while I truly loved biology as a high school student. I preferred to do the biology track as I truly enjoyed learning about biology and chemistry. In the end, I did well and secured a ticket to get in to the medical school.

The day before I departed for the university, the whole village visited my parents with whatever treasure they could carry.

"We are very proud of you, son. Be a good doctor, and come back to the village. We will need you one day," they said.

I still recall my father's deep voice while he was walking me to the railway station to get to the University premises from Bandarawela.

"I am very proud of you. I have no doubt you will go all the way. It is very important for you to remember your roots," he said. "Whatever you become, every time you come home, you are one of us, one of them." (He pointed to a fellow villager who was working along a farm yard.) "You should always be very humble," he said.

University life was a dream come true for me. There was no rice field to work; no need to offer physical labor on the farm. It was a heaven made for learning. I easily picked up high marks at the university exams.

I recall coming back to the village and sharing my experience with other boys and girls. The gates were open for them to enter universities away from the village.

Most of the boys and girls worked hard to get to the university.

Uprising

The good times did not last long. Things changed for the worse in a few months.

Suddenly, it was a tough time in Sri Lanka. I did not see this coming. It was depressing. Part-way through my first year of medical school life, a national youth uprising in 1987 resulted in several years of chaos in the country, with educational establishments closed for the period of insurgency.

Many of my batch mates were killed. They were suspected to have links with the youth-uprising group.

During what became a three-year hiatus, I tried to come to terms with the fact that I was not going to become a physician. I took solace in reading as much as I could, while helping my parents farm the surrounding rice fields and gardens in my rural village.

I really missed the university life. I missed the library the most. So, I began to convert my thoughts into words. I started to write.

I wrote poems and stories. In the end, many leading national newspapers and magazines in Sri Lanka published them one by one. In the end, I became well known in Sri Lanka, with over 3,000 written pieces. I would sit under a tree in the rice fields and write. My thoughts at that time were that if I could not be a physician, maybe I would become a journalist.

In 1990, the youth uprising was crushed, and the universities reopened. I faced a fork in the road. Should I continue with the new path and take up the post as deputy editor for a leading national science weekly in Sri Lanka, or return to my much-loved medical school and finish what I had started?

Ultimately, I chose medicine. I continued to work with media on a part-time basis, a decision that enabled me to pursue my tertiary studies without financially burdening my family. In my third year at the University of Peradeniya Medical School, I decided that the brain was the most fascinating organ in the whole body.

The Mind

The human mind always fascinated me. In fact, I was often found in the canteen, unofficially tutoring many of fellow medical students from my own class, as well as the juniors, on brain anatomy and neurological pathways. I was popular for demystifying neurosciences as a student at that time. I was quite interested in depression, anxiety, memory, and wisdom, and I often spoke on these topics on national radio at the time.

I had been learning about my own mind since I was a child, perhaps since I was about 10 or 11 years of age. A lot of people do not know their own minds. Most of us either live in the past or future, not the present, and we become daydreamers. We forget what we need to do now. We forget to live in the moment. We ruminate in the past or future. This is the root cause for suffering among us.

I graduated with high marks and secured one of the most prestigious internship appointments in Sri Lanka, at the professorial University Medical Unit and University Surgical Unit at National Hospital in Colombo, Sri Lanka.

Then fate intervened. I met a girl, who later became my wife. Born in Sri Lanka, she had moved to Australia as a young student in medicine and, as a fellow medical graduate, was taking an elective at a Sri Lankan hospital when she and I met.

At the completion of my internship, I was handpicked to be the youngest junior lecturer at the University of Peradeniya, being trained in neurology and stroke medicine under the mentorship of Prof. Nimal Senayanake. This was a highly competitive position. Prof. Senayanake is well known to the World Federation of Neurology thanks to his significant contributions in neurotoxicology in the past.

Family

At the time, I was observing the brain drain happening around me as my peers left for the U.K., Australia, and America. I hated them. I strongly felt that they had a duty to serve in the less green parts of the world.

Because of my marriage, I had to leave Sri Lanka in the end. The guilt I felt at leaving my beloved homeland in 1998 cut deep. It was some months before I could make progress in establishing a new life in Australia with my wife.

In 1999, my wife and I moved to New Zealand as part of her training in psychiatry. I then had the good fortune of working with a remarkable young infectious diseases physician, Dr. Richard Everts, who pushed me to complete physician training in Australasia while I was contemplating a neurobiology PhD at the time.

For the first time in my life, I could practice what I read in textbooks. I couldn't do that in Sri Lanka.

After completing my basic physician training in New Zealand and having our first child in North Island, we moved south, to Christchurch, where I undertook my advanced training in neurology with Prof. Tim Anderson and colleagues. Here, I developed my skills in movement disorders, stroke medicine, and headache medicine. I was on call for the EPITHET trial as an investigator 24/7 for nearly three years.

We then moved back to Australia, and I took up a post at the Royal Adelaide Hospital, where our second child was born. I underwent further training in stroke and movement disorders under the leadership of Prof. Philip Thompson, then president of the Movement Disorders Society.

In 2006, Prof. Robert Helme invited me to set up a stroke program,

see **METROPOLIS**, *page 12*

AFAN-PAUNS Congress

Two societies achieve a milestone of joint regional meetings

BY RIADH GOUIDER, MD, AND WOLFGANG GRISOLD, MD

Delegates gathered for a photo at the conclusion of the first meeting of the African Academy of Neurology conference, in Yasmine-Hammamet, Tunisia.

The first African Academy of Neurology (AFAN) conference and the 15th Pan Arab Union of Neurological Societies (PAUNS) meeting provided a unique opportunity for both societies to meet on the same premises and hold their first joint congress. More than 500 delegates attended; they represented 52 nationalities from five continents.

The **Tunisian Society of Neurology**, on behalf of the **African Academy of Neurology** and the **Pan Arab Union of Neurological Societies**, organized the meeting. To help young participants attend, the WFN, the American Academy of Neurology (AAN) and the European Academy of Neurology (EAN) initiated a joint sponsorship. The Tunisian Society of Neurology was helpful and generous in supporting this event.

The congress took place in Yasmine-Hammamet, Tunisia. The staff of the Neurology Department of Tunis served as host and conference organizer. Helping to make the conference a success was that it coincided with the Tunisian National Day of Traditional Dress.

Important topics were presented each day of the meeting:

- Day 1: Neurology training initiatives in Africa and infectious diseases of the central nervous system
- Day 2: Epilepsy and movement disorders
- Day 3: Inflammatory diseases and dementia
- Day 4: Stroke and neuropediatrics

The sessions were well attended and featured lively discussions. The opening session tackled inflammatory neuropathies, coma, paraneoplastic syndromes, and recent advances in the understanding of Parkinson's disease. Many topics deserved attention, including inflammatory aspects of the neuromuscular system, new investigation techniques, and new therapies.

The meeting's scientific program contained courses on epilepsy, stroke, and botulinum toxin use in dystonias. The program featured interesting e-poster presentations, which were well organized and showed promise that e-posters will be an important aspect of future meetings. The Tournament of the Mind winners were Dr. Osheik Seïdi, from Sudan, and Dr. Sywar Triki, from Tunisia.

The AFAN business meeting concluded with the selection of Prof. Fuad Abdallah, from Egypt, as president-elect, and Prof. Shamsideen Abayumi Ogun, from Nigeria, as president. The PAUNS business meeting also was held during the conference, with Prof. Chokri Mhiri, from Tunisia, elected president.

The WFN was represented by its president, vice president, general secretary, and two elected trustees. The EAN president and an AAN representative also attended.

Conference organizers overcame many challenges. Besides organizing a large meeting, they brought together different societies and interests, and coordinated the travel needs of participants from low-income countries to make it affordable. •

METROPOLIS

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neuroscience research program, and movement disorders program at Western Health, where resources were limited.

I went on to develop the fastest-growing stroke service in Australia at Western Health. A number of PhD students completed their higher degrees through the Western Health neuroscience research program. Our collaborations generated 10 to 15 high-quality publications in high-impact factor journals annually.

Prof. Helme is a remarkable person. We owe him a lot. He inspired a department, helped me establish a research program at Western Health, and encouraged my interest in stroke medicine. He is still my mentor. We meet every six weeks or so over a coffee, and even though he criticizes me for not doing more, he always smiles at my achievements.

I go back to Sri Lanka with surprising frequency, to promote better brain health in Sri Lanka. I have conducted more than 150 master classes in stroke medicine, headache medicine, and movement disorders throughout Sri Lanka since 2007. I have trained a young neurologist/physician from Sri Lanka at Western Health almost every year since 2008. At present, another Sri Lankan neurologist from Kandy is training with me in Melbourne, Australia.

I spend almost 70 percent of my annual leave returning to Sri Lanka. To my knowledge, I am the only permanent visiting professor of neurology to be officially appointed to a Sri Lankan University.

Australia has one of the best health care systems in the world, and I am proud to be a part of it. We deliver state-of-the-art care for our patients regardless of how much is in their pocket.

I don't believe in complaining or whining about what we don't have. Not so long ago, I did not have any office space or a personal assistant at Western Health while I was leading one the biggest stroke services in Australia. I was using a dustbin along the corridor to lean on and sign paperwork. The stroke service head from Colombo National Hospital and two other physicians who visited me noticed this in 2009. Just because I am in Melbourne does not mean I have a silver spoon.

I believe I am a link between the developing world and the developed world. If someone turned back the clock to 1998, and I was given the option of staying in Sri Lanka or coming to Australia, I would still come. I always wanted to do something great for the world and fellow human beings, and the Australian health system has given me the opportunities I never would have had in Sri Lanka.

Last year, I was very sick. I almost lost my life. At one point, I was told that I was not going to live more than two months. I recall the sleepless nights I had earlier in the illness.

"Did I get it wrong? I could have done more private practice and paid off the mortgage. Why did I spend time traveling back and forth to Sri Lanka rather than building my wealth and CV?"

I knew the answer right away. This is the best way to live my life. There is nothing that makes us happier than giving and expecting nothing in return.

I enjoy perfect health at the moment. I will continue to do my very best to dedicate my life to making life better for my fellow human beings. I have no boundaries for this purpose.

There is much more to do in this world. There is much more to do in the Asia-Pacific region. The World Federation of Neurology is our platform to do this work and to get the job done.

Make sure you sign up for the advocacy workshop at the upcoming world congress in Kyoto.

I look forward to seeing you all in Kyoto. Let's get together and promote better brain health.

Let us bring our very best to get the best possible care for our patients, irrespective of the resources we have. •

AUSTRALIA

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ments from a little before World War I, but afterward shifted his interest into the area of tuberculosis. Before doing that, he had encouraged Edward Graeme Robertson (1903-1975) to train in neurology in London where, after some distinguished clinical research work, he had already been appointed to a consultant post in neurology before returning to the Royal Melbourne Hospital in the mid-1930s. By that time, there also were physicians with major neurological interests, virtually *de facto* neurologists, in most of the Australian state capital cities, and the speciality of clinical neurology had arrived at its stage of self-sustaining expansion. •

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M.J. Eadie is with the University of Queensland, Brisbane, Australia.

Four European cities are bidding to host the World Congress of Neurology 2021, an international conference focused on advancing the diagnosis and treatment of neurological disorders. In this issue, *World Neurology* publishes four articles written by neurology organizations and professionals about why WCN 2021 should take place in Copenhagen, London, Marseille, or Rome.

COPENHAGEN

Copenhagen, a candidate host city for WCN 2021, is known as a charming, clean, safe, green city, with numerous bicycles.

BY PROF. GUNHILD WALDEMAR AND JESPER ERDAL

We are happy to present Copenhagen as the possible host city for the World Congress of Neurology 2021.

Denmark and Scandinavia

The Danish Neurological Society (DNS) was founded in 1900, and is probably the world's oldest neurological society. Although mature of age, DNS is an active and lively society that in recent years has attracted a lot of dedicated young doctors.

Leading Danish neurologists have been active in international neurological societies for many years, including Prof. Jes Olesen, Prof. Per Soelberg Sørensen, and Prof. Gunhild Waldemar, who we propose for Congress president for WCN 2021.

Greater Copenhagen is a world leader for research and development pending, clinical testing, and drug development. It comprises four life science universities with 50,000 students producing 2,000 PhDs every year, more than 150 biotech and 200 medtech companies as well as 11 university hospitals, leading researchers, clinicians, and academics.

The neurological communities in Scandinavia are closely linked and cooperate both clinically and academically. We are proud to have the full support of our friends and colleagues in the Swedish Neurological Association and the Norwegian Neurological Association.

Nordic Style

Copenhagen is a truly charming city with a distinct Nordic, cool style. It is famous for its many old buildings mixed with modern prize-winning architecture, new Nordic gastronomy, and green environment, with numerous bicycles. Copenhagen is a clean, safe city that has been voted the most livable city numerous times.

Copenhagen has the main hub airport in northern Europe and an outstandingly good infrastructure. It takes only 12 minutes to travel from the airport to city center by the inexpensive metro.

Bella Center

If Copenhagen were to win the bid, WCN 2021 would be held in October at Bella Center Copenhagen, Scandinavia's leading and largest congress center. It is conveniently situated between the airport and the city center, only 10 minutes away from both downtown Copenhagen and the airport.

In recent years, Bella Center has been the venue of several large international medical congresses.

Reaching Out to the Public

We will strive to make new knowledge from WCN 2021 known to the public and to the health care authorities by collaborating closely with local and international media, patient organizations, and through various outreach activities.

The goal is to increase the public awareness of the frequent and often disabling neurological diseases, and the many new possibilities for treatment, rehabilitation, and care.

Academic-Industrial Cooperation

We wish to help create a congress in Copenhagen that promotes academic-industrial dialogue. This is crucial because of the obvious co-dependence. Along with the WFN, we will draw upon our international industrial networks to build a solid collaboration, both before, during, and after the congress. With an uncompromising focus on high academic quality, we wish to attract industrial participants and to help include relevant industrial themes.

Trainees, Young Neurologists, and Young Researchers

The congress in Copenhagen should serve as a hub for networking among young researchers, trainees, and young neurologists. Our goal is to support and help develop the work of the WFN International Working Group of Young Neurologists and Trainees. In connection with the WCN in Copenhagen, we will give young neurologists the opportunity to visit Danish neurological departments and research groups. The Danish Association of Young Neurologists will help take good care of our young foreign colleagues.

Our aim is creating friendship and international clinical and scientific networks that can last for years and develop further over time.

Support for Colleagues

It is important for our colleagues from low-income and low-middle income countries to have the opportunity to participate in the WCN 2021. Lundbeck Foundation has therefore offered to donate 50 bursaries of 1,000 euros ($1,100 U.S.) each to neurologists from low-income and low-middle income countries.

The Danish Neurological Society offers to donate half of the society's profit from the congress to the World Federation of Neurology educational programs.

Welcome to Copenhagen in 2021

We sincerely hope to have the opportunity to welcome you to Scandinavia and Copenhagen for the World Congress of Neurology 2021. We will do our utmost to ensure that the congress will be a success, and that each and every delegate will have an exceptional and unforgettable visit. •

Written on behalf of the Danish Neurological Society by Prof. Gunhild Waldemar and Jesper Erdal, president of the Danish Neurological Society.

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LONDON

ABN conference delegates supporting the London WCN 2021 bid. Vote #NeurologyIsOpen #LondonIsOpen #WFN2021.

Members of the Association of British Neurologists (ABN) invite their colleagues throughout the world to join them in London to celebrate the 2021 World Congress of Neurology.

We last hosted this event in London in 2001, achieving a still unbroken record in delegate numbers. Much has happened in the intervening decades, both in London and in British neurology.

- **Excellent venue:** Our proposed venue, London ExCeL, played its role as a sporting venue during the 2012 Olympics and has attracted a substantial number of successful medical congresses, consistently achieving higher delegate numbers than in previous or subsequent years. The Elizabeth Crossrail line, opening in 2018, should further enhance the venue's appeal, reducing travel time into central London to just 15 minutes.
- **Neurology in the United Kingdom** has grown significantly since 2001, from about 400 consultant neurologists in 2001 to almost 800 in 2016. The ABN has more than 1,500 members, more than half of whom are consultant neurologists, with a growing and enthusiastic younger membership of trainees, junior doctors, and medical students.
- **Successful meetings**: Our 2016 annual conference, held in cooperation with the British Pediatric Neurology Association, attracted over 700 delegates supported by 100 abstract bursaries available to early career researchers. We hope to exceed that figure at our 85th anniversary meeting in 2017. Our regular pre-meeting training and development day, which includes sessions for foundation doctors, trainees, and general practitioners, has grown in popularity each year. Its work was reinforced in 2016 by the introduction of a Medical Students Day, which attracted over 100 delegates.

The association also held a joint symposium with the British Neuroscience Association in September 2016. It contributes symposia to its biennial Festival of Neuroscience and has commenced work with the Society of British Neurological Surgeons on a joint meeting planned for autumn 2018. We are confident that a London-based World Congress of Neurology would be of great interest to our colleagues in other neuroscience disciplines. Indeed, our bid is supported by 12 of our fellow U.K. and Irish neuroscience associations, and we offer these reasons we should host WCN 2021.

- **Engaged and active membership:** The ABN has more than 150 consultant and trainee members directly involved in council, research, training, services, standards, and subspecialty advisory committee roles. These comprise an excellent pool of experience and enthusiasm from which to appoint our scientific program, teaching, social, and other congress committees.
- **Committed to education**: We are committed to developing neurological training at home and abroad. Current projects include abstract bursaries (for early career researchers attending ABN meetings), travel bursaries (facilitating educational and research visits to developing countries), clinical research training fellowships (supporting the next generation of researchers), undergraduate prizes and intercalated degree bursaries (encouraging undergraduate interest in neurology). We provide speakers to many overseas meetings, and our international committee is charged with reviewing and extending this work.
- **Superb travel connections:** Our chosen venue, London ExCeL, is in the best-connected city in the world that can be reached by more people, from more destinations, in less time, than any other global destination. WCN2021 will take place three years after the high-speed London Crossrail link opens, speeding conference attendees to the venue to hear the most cutting-edge neuroscience at a truly globally connected conference center. It will provide direct access from Heathrow Airport to ExCeL in 43 minutes, with 12 trains per hour that can carry 1,500 passengers.
- **U.K. is open:** The ABN's 2017 annual meeting theme in Liverpool is "A Port to a World." This theme reflects our approach to neurology — welcoming colleagues from around the globe, treating patients from every land and every part of society, and traveling overseas to learn and to share skills. Thus for us, WCN2021 in London will be an even bigger "port" to welcome the global neurological community.
- **A notable anniversary:** 2021 is a particularly appropriate year to invite the neurological world to London as it marks the 400th anniversary of the birth of Thomas Willis, considered by many as the father of neurology. He was the first to coin the term "neurology" and to identify the Circle of Willis anatomically. What better place for the WFN to celebrate this anniversary than in the country of his birth?

We believe that a London-based World Congress of Neurology would be both popular and scientifically successful, and we hope that we will be given the opportunity to welcome the congress to London in 2021.

Hashtag: *#NeurologyIsOpen #LondonIsOpen Vote London #WFN2021* •

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MARSEILLE

BY PROF. GILLES EDAN, PROF. JEAN-MARC LEGER AND PROF. JEAN-PHILIPPE AZULAY

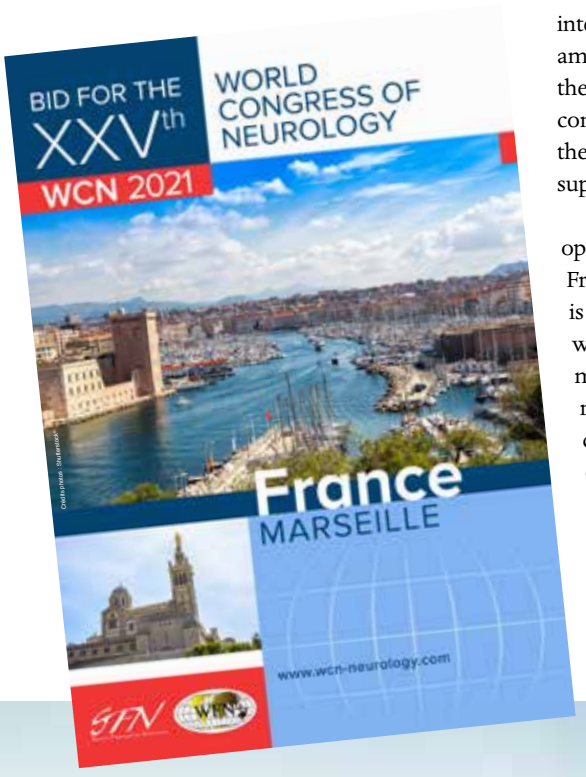
France and the French Society of Neurology would like to be a candidate to host the World Congress of Neurology in 2021. France has never had this opportunity before and would be proud to convince the Council of Delegates to choose our country.

The Société de Neurologie de Paris was established on June 8, 1899, and its first meeting was held on July 6, 1899. It was renamed Société Française de Neurologie in 1949, and celebrated its 100th birthday June 16, 1999, in Paris. Our society is one of the oldest in the world, and a number of famous neurologists are part of our heritage.

The French Society of Neurology has an old and rich history, but also is a vivid society with an annual congress assembling more than 3,000 neurologists each year. The French teams are major contributors in all the fields of clinical neurosciences and will work with the international committee to develop an amazing scientific program. It is also the decision of the society to open the congress to participants from all around the world, with an intensive program of support dedicated to young neurologists.

To emphasize and symbolize this opening to the world, the city that the French Society of Neurology has chosen is Marseille. The oldest city of France was founded in 600 BC and became the main Greek city of the Western Mediterranean. Marseille is the second-largest city in France and is located in the south of the country by the Mediterranean Sea. It is the capital of Provence, one of the most visited parts of the world.

The Phocean City is a cosmopolitan port where people have met from around the world for centuries. Marseille is Europe's door to all the Mediterranean countries, Africa, and Maghreb.



Marseille Provence Airport (MRS) welcomed 8.5 million passengers in 2016 and is currently linked to 96 destinations in 25 countries, with 129 scheduled services. MRS is well connected to all major hubs, providing easy access from all over the world at competitive airfares. Up to 36 daily flights are being offered to Paris-Charles de Gaulle (just a 90-minute flight), London-Heathrow, Frankfurt, Munich, Amsterdam, Brussels, Madrid, Rome, Lisbon, Istanbul, Montreal, Algiers, Casablanca, and Tunis. It is only a 25-minute drive from the airport to Marseille city center.

Marseille can be reached in less than three hours by high-speed train, with departures every hour. The train station is in the heart of the city.

October is a perfect time to come and visit the Provence Cote-d'Azur region and make a stop in Paris. The average temperature is 24°C/75°F, perfect weather to enjoy the Mediterranean Sea!

The entire French neurological community enthusiastically supports this candidacy and hopes that it will be successfully considered. •

Prof. Gilles Edan is the 2017 SFN president.
Prof. Jean-Marc Leger is the WFN French delegate.
Prof. Jean-Philippe Azulay is a member of the local organizing committee.

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ROME

The legendary origins of Rome are seen in this sculpture of the wolf with the founders of Rome — Romulus and Remus.

The Italian Society of Neurology (SIN) is bidding to host the 25th World Congress of Neurology in 2021 in Rome. The Society was founded in 1907 with the mission to promote the study of neurology in Italy; foster scientific research, education, and specialist updating; and improve the quality of care delivered to patients with neurological diseases. SIN is an association of public and private neurology specialists, working in community, hospital, and university settings. It represents 3,000 members, making it the largest association of neurologists in Italy, providing a constantly growing number of education and training activities.

The Society's training and updating activities are designed to enhance care activities, promote research studies into nervous system diseases, and facilitate interaction with patient organizations. Much research work is recognized at the highest international levels, contributing to the prestige of the Italian neurological community. SIN develops and promotes a wealth of clinical and scientific initiatives.

The vastness of the spheres of clinical neurology has prompted the development of working groups within SIN. Where required, these seek the expertise and contribution of specialists from other disciplines with a view to providing exhaustive responses to population needs. SIN's official journal, *Neurological Sciences*, has a 2016 impact factor close to 2 and is among the leading European scientific journals in the field.

Italy is a valid representative of the European neurological community. The number of practicing neurologists in Italy is among the highest on the continent and its research activities hold top-ranking positions in international indexes.

Its geographic position and cultural vocation place Italy in a pivotal position among nations with a longstanding neurological tradition and North African and Middle Eastern regions keenly committed to the field of neurology. The Italian neurological community has many representative members in international societies in various branches of neurology, besides supporting projects to develop care, research, and scientific updates in all neurological subspecialties.

An active and positive member of the WFN, Italy has participated both at the structural level and in the WFN's various ongoing activities. It should first be stressed that Rome was the venue of the WFN World Congress in 1961, and many Italian clinical neuroscientists have played an active role in WFN activities over at least the last 50 years.

Italy offers beautiful cities with modern conference venues, hotels, restaurants, infrastructure, and places of interest. Conference delegates coming to Italy will greatly enjoy the wide variety of suitable venues that provide a high standard of hospitality, with competitive prices compared to other European cities. No less important is that Italy, its history, and its culture attract high numbers of congress delegates.

For a variety of reasons, the presence of many active neurologists from all over the world in Italy, be it temporarily or permanently, prompts the need to host WCN.

Rome, often referred to as "The Eternal City," is among the world's most alluring venues, combining its leading role in the international multicultural scene with its millenary history. Alongside the splendors of ancient Rome and important archaeological remains, such as the Colosseum and the extensive Imperial Fora, visitors are party to some of the best examples of the world's Renaissance art. Delegates will be able to admire the works of some of the greatest artists whose achievements continue to adorn the city as they have done over the centuries. The Italian capital is the home of important museums (including the Vatican buildings) and interesting permanent exhibitions. A visit to this city will enhance the artistic passion of enthusiasts of every art form (painting, sculpture, music, etc.).

Last but not least, being the world capital of Christianity, Catholic delegates from all over the world would have a wonderful opportunity to visit the Vatican.

Importantly, Rome can be easily reached from all corners of the globe. In addition, a modern, functional, attractive convention center, designed by one of the greatest living architects (Massimiliano Fuksas), has recently been opened in the city, rendering delegates' time at the congress venue even more pleasant and productive. •

WCN 2017

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Kyoto, Japan

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Early Registration Deadline: **June 15, 2017**

Defining the Future of Neurology